

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:  
William T. Newport

Serial No.: 10/824,055

Confirmation No.: 6098

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Filed: April 14, 2004

Group Art Unit: 3692

Examiner: Shahid R. Merchant

For: SCALING ORDER MATCHING BEYOND ONE PROCESSOR IN EXCHANGE  
SYSTEMS

MAIL STOP APPEAL BRIEF - PATENTS  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

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February 6, 2008  
Date

/Jon K. Stewart/  
Jon K. Stewart

**APPEAL BRIEF**

Dear Sir:

Applicants submit this Appeal Brief to the Board of Patent Appeals and Interferences on appeal from the decision of the Examiner of Group Art Unit 3694 dated September 6, 2007, finally rejecting claims 1-20. The final rejection of claims 1-20 is appealed. This Appeal Brief is believed to be timely since it is transmitted by the due date of February 6, 2008, as set by the filing of a Notice of Appeal on December 6, 2007. Please charge the fee of \$510.00 for filing this brief to:

Deposit Account No. 09-0465 / ROC920030403US1.

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### **Real Party in Interest**

The present application has been assigned to International Business Machines Corporation, Armonk, New York.

### **Related Appeals and Interferences**

Applicant asserts that no other appeals or interferences are known to the Applicant, the Applicant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

### **Status of Claims**

Claims 1-20 are pending in the application. Claims 1-20 were originally presented in the application. Claims 1-20 stand finally rejected as discussed below. The final rejections of claims 1-20 are appealed. The pending claims are shown in the attached Claims Appendix.

### **Status of Amendments**

All claim amendments have been entered by the Examiner. No amendments to the claims were proposed after the final rejection.

## Summary of Claimed Subject Matter

Claimed embodiments include methods (*see claims* 1-11), computer programs stored on computer readable storage media (*see claims* 12-16) and computer systems (*see claims* 17-20) directed to processing securities orders in an exchange and, more particularly, to techniques and systems for scaling order processing capacity on demand. *See Application*, 1:8-10, 1:16-18, 4:9-17, Abstract.

### A. CLAIM 1 – INDEPENDENT

Claim 1 recites a method for dynamically scaling order processing in a securities exchange. *See Application*, 1:8-10, 2:16-18, 2:20-27, 4:9-17, Figure 4, 400. As claimed, this method includes maintaining one or more books for a security at the securities exchange. *See Application*, 5:25-30, Figure 2, 220<sub>X1-XM</sub>, Figure 4, 402. The one or more books each list orders related to the security. *See Application*, 5:32-34, 6:1-8. As claimed, this method also includes monitoring a volume of orders related to the security received at the securities exchange. *See Application*, 6:27-32, Figure 4, 402. And also includes varying the number of books maintained for the security based on the monitored volume of orders. *See Application*, 7:6-19, 7:29-33, 8:1-6, Figure 4, 404, 410. As claimed, this method also includes distributing orders related to the security and received at the securities exchange among the books maintained for the security. *See Application*, 7:21-27, 8:22-29, Figure 4, 408, 8:22-29, Figure 5. And also includes balancing the monitored order volume among the books. *See Application*, 7:21-27, Figure 4, 408.

### B. CLAIM 12 – INDEPENDENT

Claim 12 is directed to a computer-readable medium containing a program for dynamically scaling order processing in a securities exchange which, when executed by a processor performs a set of operations. *See Application*, 1:8-10, 2:16-18, 2:29-34, 3:1-3, 4:27-34, 5:1-7, Figure 4, 400. As claimed, the operation includes maintaining one or more books for a security at the securities exchange. *See Application*, 5:25-30, Figure 2, 220<sub>X1-XM</sub>, Figure 4, 402. Also, the one or more books each list orders related

to the security. *See Application*, 5:32-34, 6:1-8. The operation also includes monitoring a volume of orders related to the security received at the securities exchange. *See Application*, 6:27-32, Figure 4, 402. And also includes varying the number of books maintained for the security based on the monitored volume of orders. *See Application*, 7:6-19, 7:29-33, 8:1-6, Figure 4, 404, 410. As claimed, the operation also includes distributing orders related to the security and received at the securities exchange among the books maintained for the security, wherein the program is configured to balance the monitored order volume among the books. *See Application*, 7:21-27, 8:22-29, Figure 4, 408, 8:22-29, Figure 5.

#### C. CLAIM 17 – INDEPENDENT

Claim 17 is directed to a computer system capable of dynamically allocating resources for processing orders related to a security. *See Application*, 1:8-10, 2:16-18, 3:5-13, 4:27-34, 5:1-7, Figure 4, 400. As claimed, the system includes a processor, *see Application*, 6:10-16, 5:32-33, and one or more books maintained for the security by a securities exchange, each book listing orders related to the security. *See Application*, 5:25-30, 5:32-34, 6:1-8, Figure 2, 220<sub>X1-XM</sub>, Figure 4, 402. As claimed the system also includes a memory containing an executable component. *See Application*, 5:32-34, 6:1-9. As claimed, the executable component is configured to monitor a volume of orders related to the security received by the securities exchange, *see Application*, 6:27-32, Figure 4, 402, and to vary the number of books maintained for the security based on the monitored volume of orders. As claimed, the executable component is also configured to distribute orders related to the security and received by the securities exchange among the books maintained for the security, *see Application*, 7:21-27, 8:22-29, Figure 4, 408, 8:22-29, Figure 5, and to balance the monitored order volume among the books. *See Application*, 7:21-27, Figure 4, 408.



### **Grounds of Rejection to be Reviewed on Appeal**

1. Rejection of claims 1-20 under 35 U.S.C. § 102(e) as being anticipated by *Serkin et al.*, U.S. Patent Application Publication No. 2003/0229567 (hereinafter *Serkin*).

## **ARGUMENTS**

### **1. Serkin Does Not Anticipate Claims 1-20 under 35 U.S.C. § 102(e)**

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

*Serkin* discloses "a system an electronic securities market includes a configurable look-up table that has assignment entries that assign each of a plurality of securities to one or more securities processors in the system." *Serkin, Abstract*. As disclosed in *Serkin*, the "securities processor processes the security order and effectuates the trading of the security." *Serkin*, ¶ 31. Additionally, *Serkin* discloses that "by assigning certain securities to certain securities processors, a single securities processor is not required to process all of the orders handled by the computerized trading system 16." *Serkin*, ¶ 31. As orders for a given security are received, an "order routing system" is used to transmit each individual order to the "securities processor" assigned to process orders for the given security. Further, the system disclosed in *Serkin* allows an administrator to assign additional "securities processors" to process orders for a given security. For example, *Serkin* discloses

Since additional securities processors can be added to system 10 to accommodate higher trade volumes, computerized trading system 10 is scalable. For example, if administrator 62 decided that the load level of all six securities processors were too high and, therefore, reassigning securities from one securities processor to another would not free up any bandwidth, a seventh securities processor can be added to system 16. This new securities processor would be given a unique address or identifier and look-up table 50 would be modified so that one or more securities are assigned to this newly added securities processor. Additionally, as these securities processor are each autonomous processors that run separately and independently of each other, the new

securities processor may be added and tested without jeopardizing the stability of computerized trading system 16. For example, a seventh securities processor may be added and, prior to the system executing trades of actual securities, this new securities processor can be tested. A batch test-procedure can be used to trade "test" securities to verify the securities processor's reliability prior to actually using the new securities processor in the system. Once the reliability of the new securities processor is established, look-up table 50 can be modified to assign actual securities to that newly-added securities processor.

*Serkin*, ¶ 47. This passage describes an administrator making a decision to vary the number of "securities processors" in response to load levels. The Examiner relies on these passages to argue that *Serkin* anticipates the present claims. Specifically, the Examiner suggests as follows:

As per claim 1, *Serkin* teaches a computer-implemented method for dynamically scaling order processing in a securities exchange, comprising: maintaining one or more books for a security at the securities exchange, wherein the one or more books each list orders related to the security (see paragraph 31); monitoring volume of orders related to the security received at the securities exchange (see paragraph 47);

*Final Office Action*, p. 4. The Examiner argues that the "securities processor" disclosed in *Serkin* configured to "processes the security order and effectuates the trading of the security" anticipates the claimed "one or more books for a security at the securities exchange, wherein the one or more books each list orders related to the security." In fact, however, the "securities processor" in *Serkin* provides a processing component (presumably an executable program) configured to process individual orders for a trade.

At the same time, the "securities processors" does not provide the equivalent of the claimed "one or more books for a security at the securities exchange, wherein the one or more books each list orders related to the security." Instead, the "securities processor" provides a processing component assigned to a given security and configured to identify and process orders for that security. For example, Figure 3 illustrates the "securities processor" processing an order. In describing an example of the processing performed by the "securities processor" *Serkin* provides as follows:

order 12 pertains to one-hundred shares of XYZ Corp. that Market Participant A wishes to purchase for \$17.00 per share. This order, which represents a bid-to-buy XYZ Corp. is entered into the order book (not

shown) for securities processor 12 for subsequent matching with a corresponding offer-to-sell XYZ Corp.

During the course of the day, the trade value of the security (XYZ Corp., for example) will vary as market conditions fluctuate. Whenever a market participant is offering a security for sale at the same price that another market participant is willing to pay for the security, matching process 104 executes a trade between those two market participants. However, if the highest bid (hereinafter buy) is lower than the lowest offer (hereinafter sell), the security will not be traded and these pending bids and offers will remain on the security order book. This price differential between the lowest offer-to-sell and the highest bid-to-buy is commonly referred to as the "spread".

*Serkin*, ¶ 41-42. Clearly, the "securities processor" is not a "book" maintained for a security where "the one or more books each list orders related to the security." *Serkin* expressly describes the "order book" as being something else.

Further, *Serkin* fails to teach a "method for dynamically scaling order processing in a securities exchange that includes "varying the number of books maintained for the security based on the monitored volume of orders," as recited by claim 1. Instead, *Serkin* discloses that an "administrator" may manually adjust the configuration of a system adjust the number of "securities processors." Regarding this limitation, the Examiner cites *Serkin* ¶ 47, set forth above. However, rather than disclosing a computer implemented method of monitoring the a number of books maintained for a security and varying the books based on a monitored volume of orders, *Serkin*, ¶ 47 describes an administrator making a decision to vary the number of securities processors based on load levels. Nothing in this passage discloses a computer implemented method which performs a step of actively "monitoring a volume of orders related to the security received at the securities exchange," and "varying the number of books maintained for the security based on the monitored volume of orders," as recited by claim 1. Instead, it describes an administrator adding a "securities processor" to a system "to accommodate higher trade volumes."

Thus, at best, *Serkin* teaches that it is possible for the administrator to assign securities to various processors, possibly taking into consideration current trading volume. Applicant submits, therefore, that *Serkin* does not teach a computer implemented method that includes monitoring a volume of orders related to the security

received at the securities exchange. Nor does *Serkin* teach a computer implemented method that includes varying the number of books maintained for the security based on the monitored volume of orders.

The Examiner rejects claims 12 and 17 suggesting that “Claims 12 and 17 are in parallel with claim 1 and are rejected for at least the same reason as set forth above (see also paragraphs 67 and 68). *Final Office Action*, p. 7. However, the discussion above regarding claim 1 is even more forceful when considering the particular limitations of claims 12 and 17. Claim 12 teaches a computer-readable medium containing a *program* for dynamically scaling order processing in a securities exchange which, when executed by a processor performs operations comprising monitoring a volume of orders related to the security received at the securities exchange and vary the number of books maintained for the security based on the monitored volume of orders. That is, the operations of *the program* include monitoring and varying actions, as recited by claim 12. As stated above, *Serkin* describes the ability of an administrator to vary the number of “securities processors” assigned to process orders based on load levels, which again, do not anticipate the limitation of “maintaining one or more books for a security at the securities exchange, wherein the one or more books each list orders related to the security,” in any event. Accordingly, Applicants submit that *Serkin* does not disclose an *executable program* that monitors a volume of orders related to the security received at the securities exchange and varies the number of books maintained for the security based on the monitored volume of orders.

Claim 17 teaches a memory containing an executable component, which when executed on the processor is configured to monitor a volume of orders related to the security received by the securities exchange, and configured to vary the number of books maintained for the security based on the monitored volume of orders. As stated above, *Serkin* describes the ability of an administrator to vary the number of “securities processors” based on load levels, but nowhere does *Serkin* describe monitoring a volume of orders and varying the number of books based on the monitored volume by an executable component. At best, *Serkin* teaches the use of an executable component that includes a securities lookup process which allocates securities to their designated

processor. *Serkin* does not disclose that the allocation process takes into consideration monitored volume of orders, or that the allocation exchange varies the number of books based on volume.

For all the foregoing reasons, Applicants submit that claims 1, 12, 17, and their dependents are allowable, and respectfully request that the Board vacate the present rejection with instructions to allow all claims.

## CONCLUSION

The Examiner errs in finding that claims 1-20 are anticipated by *Serkin*.

Withdrawal of the rejections and allowance of all claims is respectfully requested.

Respectfully submitted, and  
**S-signed pursuant to 37 CFR 1.4,**

/Gero G. McClellan, Reg. No. 44,227/

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Gero G. McClellan  
Registration No. 44,227  
Patterson & Sheridan, L.L.P.  
3040 Post Oak Blvd. Suite 1500  
Houston, TX 77056  
Telephone: (713) 623-4844  
Facsimile: (713) 623-4846  
Attorney for Appellant(s)

## CLAIMS APPENDIX

1. (Previously Presented) A computer-implemented method for dynamically scaling order processing in a securities exchange, comprising:
  - maintaining one or more books for a security at the securities exchange, wherein the one or more books each list orders related to the security;
  - monitoring a volume of orders related to the security received at the securities exchange;
  - varying the number of books maintained for the security based on the monitored volume of orders;
  - distributing orders related to the security and received at the securities exchange among the books maintained for the security; and
  - balancing the monitored order volume among the books.
2. (Previously Presented) The method of claim 1, wherein varying the number of books maintained for the security based on the monitored volume of orders comprises:
  - upon determining if the monitored volume of orders related to the security exceeds a maximum threshold value, opening a new book for the security.
3. (Original) The method of claim 2, wherein opening a new book for the security comprises creating a logical partition.
4. (Original) The method of claim 2, wherein opening a new book for the security comprises allocating one or more processors to the new book.
5. (Previously Presented) The method of claim 2, wherein varying the number of books maintained for the security based on the monitored volume of orders further comprises:
  - upon determining if the monitored volume of orders related to the security falls below a minimum threshold value, closing one or more books maintained for the security.
6. (Previously Presented) The method of claim 5, wherein the maximum threshold value and the minimum threshold values are different.



7. (Original) The method of claim 1, wherein maintaining one or more books for the security at the exchange comprises maintaining at least one book for the security on at least two different servers.
8. (Original) The method of claim 1, wherein monitoring the volume of orders related to the security received at the exchange comprises dividing the total volume of orders related to the security received at the exchange by the number of books maintained for the security.
9. (Original) The method of claim 1, further comprising publishing the top of each book maintained for the security.
10. (Original) The method of claim 9, further comprising matching an order listed on one of the books maintained for the security with one of the other books maintained for the security.
11. (Original) The method of claim 9, further comprising matching an order listed on one of the books maintained for the security with a book maintained for the security at another exchange.
12. (Previously Presented) A computer-readable medium containing a program for dynamically scaling order processing in a securities exchange which, when executed by a processor performs operations, comprising:
  - maintaining one or more books for a security at the securities exchange, wherein the one or more books each list orders related to the security;
  - monitoring a volume of orders related to the security received at the securities exchange;
  - varying the number of books maintained for the security based on the monitored volume of orders; and
  - distributing orders related to the security and received at the securities exchange among the books maintained for the security, wherein the program is configured to balance the monitored order volume among the books.

13. (Previously Presented) The computer-readable medium of claim 12, wherein varying the number of books maintained for the security based on the monitored volume of orders comprises:

upon determining if the monitored volume of orders related to the security exceeds a maximum threshold value, notifying an administrator and providing the administrator with an interface allowing the administrator to open a new book.

14. (Previously Presented) The computer-readable medium of claim 12, wherein varying the number of books maintained for the security based on the monitored volume of orders comprises:

upon determining if the monitored volume of orders related to the security exceeds a maximum threshold value, opening a new book for the security.

15. (Original) The computer-readable medium of claim 12, further comprising providing an interface allowing an administrator to specify the maximum threshold value.

16. (Original) The computer-readable medium of claim 12, further comprising providing an interface allowing an administrator to specify how orders related to the security and received at the exchange should be distributed among the books maintained for the security.

17. (Previously Presented) A computer system capable of dynamically allocating resources for processing orders related to a security, comprising:

a processor;

one or more books maintained for the security by a securities exchange, each book listing orders related to the security; and

a memory containing an executable component, which when executed on the processor, is configured to:

monitor a volume of orders related to the security received by the securities exchange,

vary the number of books maintained for the security based on the monitored volume of orders,

distribute orders related to the security and received by the securities exchange among the books maintained for the security, and  
balance the monitored order volume among the books.

18. (Previously Presented) The computer system of claim 17, wherein the one or more books maintained for the security at the exchange comprises:  
at least a first book for the security maintained on a first server; and  
at least a second book for the security maintained on a second server.
19. (Previously Presented) The computer system of claim 17, wherein the one or more books are maintained on a computer system having multiple logical partitions.
20. (Previously Presented) The computer system of claim 19, wherein each book is assigned to a different logical partition.

## EVIDENCE APPENDIX

None.

## RELATED PROCEEDINGS APPENDIX

None.